

What is claimed is:

1. A simplified method for generating a tone scale transformation for use in digital printing, comprising the steps of:
- 5                               printing a test page on a known printing system and a known substrate;
- gathering image intensity data from the test page;
- comparing the gathered data to information obtained from a plurality of tone scale transformations;
- 10                               selecting the tone scale transformation that best matches the gathered data; and
- using the selected tone scale transformation to provide a tone scale for use on the known printing system and the known substrate.
- 15       2. A method as claimed in claim 1 further comprising the step of allowing a user to set a limit on maximum amount of ink to be applied to the known substrate.
- 20       3. A method as claimed in claim 1 wherein the step of gathering image intensity data comprises the step of measuring image intensity at at least two inking levels to determine both an upper ink limit and shape of a tone scale correction curve..
- 25       4. A method as claimed in claim 3 wherein the step of measuring image intensity at at least two inking levels comprises the step of measuring image intensity at a maximum ink level and at a mid tone ink level.
5. A method as claimed in claim 4 wherein the midtone ink level comprises an approximate one third tone ink level.

6. A method as claimed in claim 3 wherein the step of comparing the gathered data comprises the step of comparing a ratio of image intensity data at the two inking levels to ratios of intensity levels obtained from a plurality of transformations at similar inking levels.

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7. A method as claimed in claim 1 wherein only one inking level is required to derive a tone scale correction curve for a system with a known maximum ink tone value.

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8. A method as claimed in claim 1 wherein the plurality of tone scale transformations comprise a transform having a plurality of fitting parameters.

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9. A method as claimed in claim 8 wherein information obtained from the plurality of tone scale transformations comprises information relating image intensity ratios corresponding to at least two inking levels to values of each of the plurality of fitting parameters.

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10. A method as claimed in 9 wherein the step of selecting the tone scale transformation comprises the step of individually selecting values for each fitting parameter that best matches the gathered data for the known system and known substrate.

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11. A method as claimed in claim 8 wherein acceptable ranges for the plurality of fitting parameters are determined from prior measurements of transforms on a variety of substrates and printing systems.

12. A method as claimed in claim 8 wherein the transform having a plurality of fitting parameters comprises a polynomial transform.

13. A method as claimed in claim 3 wherein the step of gathering image intensity data comprises the step of using a spectrophotometer.

5 14. A method for real time or periodic system control of a digital printing system comprising the step of periodically gathering image data and selecting appropriate transforms according to the simplified method of claim 1.

10 15. A method for providing information obtained from a plurality of tone scale transformations useful for simplified selection of a tone scale transformation comprising the steps of:

- printing full linear ink gradations on multiple substrates;
- generating a curve shape table with a plurality of points for each of the multiple substrates and/or ink gradations;
- 15 fitting a multiple parameter curve to the plurality of points of each curve shape table to generate a plurality of multiple parameter curves;
- selecting at least one point in the plurality of multiple parameter curves that show high variation from one curve to a next curve;
- plotting coefficients of a group of multiple parameter curves as functions of a value of the at least one point.

20 16. A method as claimed in claim 15 further comprising the step of deriving a prescribed tone scale table from the plurality of polynomial curves and the at least one point.

25 17. A method as claimed in claim 15 further comprising the step of monitoring a specified number of variables for real time or periodic system control.

18. A method as claimed in claim 15 further comprising the step of measuring tone values.

5 19. A method as claimed in claim 17 wherein the step of measuring tone values comprises the step of visually comparing charts to determine a one-third tone point.

10 20. A method as claimed in claim 14 wherein the curve shape table comprises a linearization table.